SERVICES DIRECTORY
REGIONAL TECHNICAL SERVICES

Geotechnical Section

Materials Section

Independent Assurance Sampling and Testing (IAST) Program

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

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FOREWORD

The mission of Regional Technical Services is to provide materials and geotechnical engineering services in support of Department capital and maintenance programs. This is accomplished through specialized equipment, laboratory facilities, and trained personnel provided by Regional Design and Construction sections. Regional Technical Services Sections operate regional laboratories, use testing and exploration equipment provided by the Technical Services Division, and implement an active program of training and quality assurance. The staffing, procedures, equipment, and capabilities of Regional Technical Services are built upon quality assurance. The Independent Assurance Sampling and Testing (IAST) program is also entirely dedicated to this function.

To ensure an acceptable quality level for the program and procedures, both the Materials and Geotechnical Engineering Bureaus have independent programs for evaluation of regional testing laboratories and personnel. The AASHTO Materials Reference Laboratory Service and the Soil Mechanics Reference Laboratory Program are designed to enhance uniformity and provide independent crosschecks of laboratory procedures and equipment. These programs not only provide this independent verification, but improve the Department's credibility with the contracting community and support its decisions and positions in instances where disputes need to be mediated.

Laboratory equipment is frequently inspected and calibrated, and training is always available for new staff in existing procedures or to introduce new ones, either planned or on demand. These efforts assure quality that can be seen in the field and have earned national recognition for these program areas.

This is intended primarily for new and current Department staff, and describes services provided by Regional Technical Services Sections.

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GEOTECHNICAL ENGINEERING SECTION

Design Services and Site Analyses

Services provided in this program area encompass all phases of engineering where geotechnical expertise can be used in project development, design and construction. A thorough evaluation of site conditions early in project development can avoid the need for expensive solutions to problems encountered later in design or in construction. A key aspect of the services provided is the collection and analysis of geotechnical data through field sampling and laboratory testing. The level of detail, the scope and the timing of services are tailored to the client.

The following reports and services are available through the Regional Geotechnical Engineer with support from the Geotechnical Engineering Bureau:

Reports

- *Terrain Reconnaissance Reports* provide information for use in project scoping and development that draw upon the area concept of soils as applied to geotechnical engineering. This is a useful tool for identifying troublesome deposits that should be avoided or may require special attention and/or treatment in design and construction. Some limited subsurface explorations can be progressed at this stage of a project.

- *Preliminary Geotechnical Engineering Reports* present recommendations based on the evaluation of design options from a geotechnical standpoint. Comments on the deficiencies and benefits of options and identifying other more optimal approaches would be included. Any need for additional subsurface exploration can be identified at this time.

- *Final Geotechnical Engineering Reports* present detailed design recommendations for geotechnical issues within project limits. Special specifications and notes are provided for inclusion in contract documents. Recommendations are based on pertinent subsurface information, field inspection and existing reports.

Services

- *Pavement Evaluation/Inspection* can be performed to determine subgrade conditions and the structural capacity of roadway foundations for inclusion in project-level pavement evaluation decision-making. Subsurface drainage recommendations and subgrade resilient modulus can be provided. Issued reports will supplement the recommendations of the Regional Materials Section.

- *Structure Design Parameters* regarding the strength and behavior of soil are developed through sampling, testing and analysis. Such parameters can be provided for consideration in the design of earth retaining systems, structure foundations and in the determination of safe excavation limits.

- *Site Investigations* are coordinated and conducted to determine subsurface conditions. Subsurface information for use in design is procured through exploration programs. Recommendations concerning the most appropriate manner in which to progress an exploration program (i.e., State or contract forces) can be provided.

- *Geotechnical Support* is provided to all programs and modes of transportation, as well as to other State agencies (e.g., OGS). Recommendations entailing subsurface exploration and lab analysis is available. Recommendations regarding new geotechnical technology can also be provided.

- *Construction Consultation and Support* can be provided for all geotechnical issues associated with a project. Recommendations concerning varied site conditions and unanticipated field problems, and reviews of orders-on-contracts, can be provided. Geotechnical assistance prior to construction, during pile installation and in evaluating material quality is available. Particular projects may require preconstruction meetings having a geotechnical focus. Support at preblasting meetings and during blasting operations is also available.

- *Soil-Related Construction Materials,* such as gravels, stone fills and base and subbase material are monitored. Conformance to specifications is controlled through the sampling and testing of materials using project, Regional and Bureau laboratories. Examples of specification areas involved and associated services available are outlined below:

TABLE 1. GEOTECHNICAL ENGINEERING PRIMARY SERVICES.

Standard Specifications Section	Services/Capabilities
200: Earthwork Cut & fill sections, structure & pipe backfill,etc.	Non-Stockpile Source Approvals Gradation Testing Project Density Testing
300: Bases and Subbases	Stockpile Evaluations Non-Stockpile Evaluations Design/Construction of Stabilized Materials
600: Incidental Construction 605: Underdrains 620: Bank & Channel Protection (Stone fill material)	Stockpile Evaluations Materials Evaluations

Density and gradation testing of granular materials is provided for quality assurance. Field equipment and training are made available to project personnel.

- *Training Services* are provided by the Geotechnical Engineering Section, aimed at improving the performance and quality of soil-related inspection activity within the Region. Field and laboratory analyses offered by this section are frequently used by other clients as permitted by workload and time availability.

- *Specification Use* is monitored by the Geotechnical Engineering Section. Special specifications and appropriate contract notes for soil-related items can be provided in design, aiding in the efficient progress of field work during construction. Recommendations pertaining to the proper use of soil-related payment items can be provided in preliminary design.

- *Performance Monitoring* of long-term problems such as embankment settlement, slope failures, rock slopes and roadway movement is performed. Monitoring can be performed prior to, after and in conjunction with construction. Investigative tools and instrumentation techniques applicable to a wide range of monitoring problems are available.

- *Review of Work Permits* issued by the Transportation Planning, Highway Safety and Traffic Engineering Division, as required by the Manual of Administrative Procedures, is performed by the Regional Geotechnical Engineer. Interaction with State and consultant designers on issues such as excavation support systems, dewatering of excavations and boring and jacking details is done to ensure completeness of plans and specifications. Support regarding plan details and/or intent is provided to inspection staff and contractors during construction.

- *Review of Surplus Properties* is performed by the Regional Geotechnical Engineer who evaluates and provides recommendations prior to disposal.

- *Review of Impoundment Structures* is performed by the Regional Geotechnical Engineer. Technical assistance is provided to the New York State Thruway's Canal Corporation for site inspections, investigations and recommendations on soil-related issues concerning the stability and safety of impoundment structures.

- *Emergency Services* are provided when necessary by the Geotechnical Engineering Section. The Section is prepared to respond immediately to emergency situations, coordinating activities of investigators and mobilizing subsurface exploration equipment to assist in decision-making.

TABLE 2. MATERIALS PRIMARY SERVICES.

Specifications Section	Services/Capabilities
109: Partial Payment	Verify and inventory materials stored off project site
400: Asphalt Concrete	Plant Quality Assurance and materials acceptance Plant automation inspection and scale checks Assist project personnel with paving operations Obtain, test, and evaluate pavement cores Mix design analysis, and verification Pavement density monitoring using a Nuclear Gauge
500: Portland Cement Concrete	Plant Quality Assurance and materials acceptance Plant automation inspection and scale checks Inspect and approve haul units Provide testing equipment and supplies Mix designs, adjustments, and Class substitutions Yield tests, special mixes, protective coatings Concrete cylinder testing
555: Structural Concrete	Mix designs and approvals Inspection reports and shipping certifications Technical assistance during placement Review and approve placement equipment Assist in testing and certification of welders Obtain structural concrete cores
556: Reinforcing Steel for Concrete Structures	Sample steel reinforcing bars Quality Assurance for fabricated reinforcing bars
584: Bridge Deck Overlays	Mix designs and approvals Calibration of mobile mixers Overlay concrete testing Technical assistance for deck preparation and placement
603: Culverts and Storm Drains	CMP pipe gauging Acceptance documents Damaged pipe checks RCP testing and acceptance Process box culvert drawings for approval Precast product quality assurance
604: Drainage Structures	Process shop drawings for approval Precast product quality assurance Materials acceptance
606: Guide Railing and Median Barrier	Process shop drawings for approval Precast product quality assurance Coating checks Materials acceptance
607: Fencing	Sampling, testing, and acceptance Coating checks
619/640/685/687/688: Pavement Markings	Problem investigation and assistance during and after construction
700: Materials Details	Aggregate, cement, and emulsion quality assurance and testing Aggregate source quality assurance Paint (structural and traffic)
NYSDOT Approved List	Status of materials and equipment for use on NYSDOT projects

MATERIALS SECTION

Site Analyses and Alternative Treatment Evaluations

Most Regional Materials Sections provide appropriate pavement rehabilitation alternatives to Regional Design as they develop project proposals. The alternatives are developed in accordance with EI- 92-15, Project-Level Pavement Selection Process, and Volumes I and II of the Pavement Rehabilitation Manual. Their analysis typically includes:

- Documenting pavement distress
- Retrieving and evaluating pavement cores
- Reviewing work histories
- Obtaining input from Resident and Geotechnical Engineers

The analysis results in treatment alternative recommendations made by the Regional Materials Section. Design groups usually perform a Life-Cycle-Cost-Analysis (LCCA), and compose the Pavement Evaluation Treatment Selection Reports (PETSR).

Structural concrete coring services using portable coring equipment are available directly within the region. The Materials Bureau provides additional testing such as hardened concrete air content, compressive strength, freeze-thaw effects, chloride content, and complete matrix analysis.

Regional Materials personnel monitor and review materials performance during and after construction. Recommendations are provided with assistance from the Materials Bureau concerning cause-and-effect relationships for service life and performance prediction.

Quality of Materials

Quality Assurance of construction materials is a primary service of the Regional Materials Section. Table 2 outlines the general specifications areas and services typically provided by the Section.

Specifications Development and Conformance

Assisted by the Materials Bureau, the Regional Materials Section aids design and construction groups in applying specifications and developing special items where appropriate for economical solutions to materials engineering problems. Laboratory analysis of hot mix asphalt mix designs and quality assurance of hot mix asphalt at production facilities are seasonal, labor-intensive activities of this Section. Providing quality assurance for friction aggregates used in hot mix asphalt is a service performed by the Regional Section. Technical assistance is provided for Superpave, Heavy Duty, and Rut Avoidance hot mix asphalt mixes.
The Regional Section provides consultation, technical assistance, and quality assurance for

precast concrete plants, reinforced concrete pipe, polyethylene pipe, and corrugated metal pipe. In addition, technical assistance is provided for miscellaneous materials including fencing, guiderail, rebars, and bolts. In winter, the Section assists Resident Engineers by analyzing quality of abrasives and salt delivered under state contract.

Performance Monitoring and Investigations

Long-term performance monitoring of special mix designs, new construction techniques, innovative materials for construction, and identified problem areas are important functions of the Section. Assistance from the Materials Bureau for expertise and guidance is requested when necessary. A wide range of investigative tools are available for this work. During construction, Materials Section staff are available for daily assistance to the Regional Construction group to resolve issues in the field. The Regional Lab can rehabilitate and calibrate concrete testing equipment such as air meters and slump cones. The Section may also review advance design reports, plans, final plan submissions, and highway work permits.

Emergency Services

The Materials Section is equipped to respond immediately to emergencies as necessary. Coordinating activities of investigators and mobilizing equipment to obtain asphalt and concrete cores to assist in decision-making are important elements of crisis management.

Shared Services

The expertise and field and laboratory analyses offered by this Section are often used by other clients as workload and time availability permit. Training services provided by the Materials Section improve performance and quality of all inspection activity within the region relating to materials engineering issues. Services to regional maintenance forces are available for crack sealing, joint resealing, surface treatments, and pavement rehabilitation alternatives.

Liaison Services

Frequent interaction and comprehensive knowledge of the services and expertise available at the Materials Bureau extend the capabilities and responsiveness of the Regional Section. The Section can offer timely, state-of-the-art materials technology through its liaison role.

INDEPENDENT ASSURANCE SAMPLING AND TESTING (IAST) PROGRAM

IAST is a program mandated by the Federal Highway Administration that requires each state to have a separate group providing an independent check on the quality of sampling and testing of construction materials. This independent cross check of normal procedures and equipment is accomplished by having Technical Services personnel, other than those engaged in normal project inspection, observe and evaluate sampling and testing techniques, perform independent tests, and compare test results.

Program Function

IAST personnel take samples at the same location and time, or use a split sample taken by the technician being evaluated. Test results are intentionally not compared to specifications. Rather, procedures and equipment used by the technician in sampling and testing are observed, and the technician's test results are compared to those obtained by IAST personnel. If they are not within acceptable variations or any deviation is noted from Materials or Soils Methods, the IAST supervisor or staff investigate the causes and corrects deficiencies by instructing the tester on the proper method, or by replacing defective equipment.

Procedures

Tests are performed for each project, source, or plant according to the appropriate Materials or Soils Method as follows:

A. Portland Cement Concrete, Structures
   1. Slump: MM 9.2 M
   2. Air Content: MM 9.2 M
   3. Compressive Strength Cylinders: MM 9.2 M

B. Portland Cement Concrete, Pavements
   1. Slump: MM 9.2 M
   2. Air Content: MM 9.2 M

C. Concrete Aggregates
   1. Coarse Aggregate Gradation: MM 9.1M
   2. Fine Aggregate Gradation: MM 9.1 M

D. Hot Mix Asphalt
   1. Hot Bin Analysis: MM 5 M (Batch Plant)
   2. Composite Aggregate Gradation: MM 5 M (Drum Plant)

E. Granular Materials
   1. Sampling: SCP 13
   2. Grain Size Analysis: STM 20
   3. Field Compaction Test: STM 6, 9, or 10

F. Embankment Material
   1. Field Compaction Test: STM 6, 9 or 10

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